

SEQUENCE LISTING

<110> Reed, Jennifer Lynne

<120> RECOMBINANT IL-9 ANTIBODIES AND USES
THEREOF

<130> 10271-112-999

<140> 10/823,253

<141> 2004-04-12

<150> 60/477,797

<151> 2003-06-10

<150> 60/462,259

<151> 2003-04-11

<160> 65

<170> FastSEQ for Windows Version 4.0

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<400> 1

Gly	Tyr	Thr	Phe	Thr	Gly	Tyr	Trp	Ile	Glu
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Glu	Ile	Leu	Pro	Gly	Ser	Gly	Thr	Thr	Asn	Pro	Asn	Glu	Lys	Phe	Lys
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Gly

<210> 3

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<220>

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<400> 3

Ala	Asp	Tyr	Tyr	Gly	Ser	Asp	Tyr	Val	Lys	Phe	Asp	Tyr
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<400> 4
 Lys Ala Ser Gln His Val Gly Thr His Val Thr
 1 5 10

<210> 5
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<220>
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<400> 5
 Ser Thr Ser Tyr Arg Tyr Ser
 1 5

<210> 6
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<220>
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<400> 6
 Gln His Phe Tyr Ser Tyr Pro Leu Thr
 1 5

<210> 7
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 <213> Artificial Sequence

<220>
 <223> VH domain of antibody 4D4

<400> 7
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Gly Tyr
 20 25 30
 Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Glu Ile Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Arg Ala Asp Tyr Tyr Gly Ser Asp Tyr Val Lys Phe Asp Tyr Trp
100 105 110
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 8
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> VL domain of antibody 4D4 and 4D4 H2-1 D11

<400> 8
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Gly Thr His
20 25 30
Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45
Tyr Ser Thr Ser Tyr Arg Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Ala Thr Tyr Tyr Cys Gln His Phe Tyr Ser Tyr Pro Leu
85 90 95
Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 9
<211> 122
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<213> Artificial Sequence

<220>
<223> VH domain of antibody 4D4 H2-1 D11

<400> 9
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Gly Tyr
20 25 30
Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45
Gly Glu Trp Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Ala Asp Tyr Tyr Gly Ser Asp Tyr Val Lys Phe Asp Tyr Trp
100 105 110
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

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<223> VH CDR2

<400> 10

Glu Trp Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe Lys
1 5 10 15
Gly

<210> 11

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> VH CDR1

<400> 11

Gly Tyr Thr Phe Thr Tyr Tyr Trp Ile Glu
1 5 10

<210> 12

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> VH CDR3

<400> 12

Ala Asp Tyr Tyr Gly Ser Asp His Val Lys Phe Asp Tyr
1 5 10

<210> 13

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR1

<400> 13

Leu Ala Ser Gln His Val Gly Thr His Val Thr
1 5 10

<210> 14

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR2

<400> 14

Gly Thr Ser Tyr Arg Tyr Ser
1 5

<210> 15
 <211> 122
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH domain of antibody 4D4com-XF-9

<400> 15
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Tyr Tyr
 20 25 30
 Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Glu Trp Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ala Asp Tyr Tyr Gly Ser Asp His Val Lys Phe Asp Tyr Trp
 100 105 110
 Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> 16
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL domain of antibody 4D4com-XF-9

<400> 16
 Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15
 Asp Arg Val Thr Ile Thr Cys Leu Ala Ser Gln His Val Gly Thr His
 20 25 30
 Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
 35 40 45
 Tyr Gly Thr Ser Tyr Arg Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60
 Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 65 70 75 80
 Glu Asp Phe Ala Thr Tyr Tyr Cys Gln His Phe Tyr Asp Tyr Pro Leu
 85 90 95
 Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
 100 105

<210> 17
 <211> 122
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH domain of antibody 4D4com-2F9

<400> 17
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Gly Tyr
 20 25 30
 Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Glu Trp Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ala Asp Tyr Tyr Gly Ser Asp His Val Lys Phe Asp Tyr Trp
 100 105 110
 Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> 18
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL domain of antibody 4D4com-2F9

<400> 18
 Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15
 Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Gly Thr His
 20 25 30
 Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
 35 40 45
 Tyr Gly Thr Ser Tyr Arg Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60
 Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 65 70 75 80
 Glu Asp Phe Ala Thr Tyr Tyr Cys Gln His Phe Tyr Glu Tyr Pro Leu
 85 90 95
 Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
 100 105

<210> 19
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH CDR1

<400> 19
 Gly Gly Thr Phe Ser Gly Tyr Trp Ile Glu
 1 5 10

<210> 20
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 <212> PRT
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<220>

<223> VL CDR3

<400> 20

Gln Gln Phe Tyr Glu Tyr Pro Leu Thr
1 5

<210> 21

<211> 122

<212> PRT

<213> Artificial Sequence

<220>

<223> VH domain of antibody 7F3 and 7F3 22D3

<400> 21

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Gly Tyr
20 25 30
Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45
Gly Glu Ile Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Ala Asp Tyr Tyr Gly Ser Asp Tyr Val Lys Phe Asp Tyr Trp
100 105 110
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 22

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> VL domain of antibody 7F3

<400> 22

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Gly Thr His
20 25 30
Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45
Tyr Ser Thr Ser Tyr Arg Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Phe Tyr Glu Tyr Pro Leu
85 90 95
Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 23

<211> 122

<212> PRT
<213> Artificial Sequence

<220>
<223> VH domain of antibody 71A10

<400> 23
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Gly Tyr
20 25 30
Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45
Gly Glu Ile Leu Pro Gly Ser Gly Thr Thr Asn Pro Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Ala Asp Tyr Tyr Gly Ser Asp Tyr Val Lys Phe Asp Tyr Trp
100 105 110
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 24
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> VL domain of antibody 71A10

<400> 24
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Gly Thr His
20 25 30
Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45
Tyr Ser Thr Ser Tyr Arg Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Phe Tyr Glu Tyr Pro Leu
85 90 95
Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 25
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> VL domain of antibody 7F3 22D3

<400> 25
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Gly Thr His

			20						25					30			
Val	Thr	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile		
		35					40					45					
Tyr	Gly	Thr	Ser	Tyr	Arg	Tyr	Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly		
	50					55					60						
Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro		
65					70					75					80		
Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Phe	Tyr	Glu	Tyr	Pro	Leu		
			85						90					95			
Thr	Phe	Gly	Gly	Thr	Lys	Val	Glu	Ile	Lys								
		100					105										

<210> 26
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH CDR1

<400> 26
 Gly Gly Thr Phe Ser Tyr Tyr Trp Ile Glu
 1 5 10

<210> 27
 <211> 122
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH domain of antibody 7F3com-2H2

<400> 27
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Tyr Tyr
 20 25 30
 Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Glu Ile Leu Pro Gly Ser Gly Thr Thr Asn Pro Asn Glu Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Ser Thr Ala Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ala Asp Tyr Tyr Gly Ser Asp Tyr Val Lys Phe Asp Tyr Trp
 100 105 110
 Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> 28
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL domain of antibody 7F3com-2H2

<400> 28

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1          5          10          15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Ile Thr His
          20          25          30
Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
          35          40          45
Tyr Gly Thr Ser Tyr Ser Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
          50          55          60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65          70          75          80
Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Phe Tyr Glu Tyr Pro Leu
          85          90          95
Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
          100          105

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<210> 29
 <211> 122
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH domain of antibody 7F3com-3H5

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<400> 29
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
 1          5          10          15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Gly Tyr
          20          25          30
Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
          35          40          45
Gly Glu Ile Leu Pro Gly Ser Gly Thr Thr Asn Pro Asn Glu Lys Phe
          50          55          60
Lys Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Ser Thr Ala Tyr
65          70          75          80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
          85          90          95
Ala Arg Ala Asp Tyr Tyr Gly Ser Asp Tyr Val Lys Phe Asp Tyr Trp
          100          105          110
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
          115          120

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<210> 30
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL domain of antibody 7F3com-3H5

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<400> 30
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1          5          10          15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln His Val Gly Thr His
          20          25          30
Val Thr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
          35          40          45
Tyr Gly Thr Ser Tyr Arg Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
          50          55          60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65          70          75          80

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Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Phe	Tyr	Glu	Tyr	Pro	Leu
				85					90					95	
Thr	Phe	Gly	Gly	Gly	Thr	Lys	Val	Glu	Ile	Lys					
			100					105							

<210> 31
 <211> 122
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH domain of antibody 7F3com-3D4

Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	Pro	Gly	Ser
1				5					10					15	
Ser	Val	Lys	Val	Ser	Cys	Lys	Ala	Ser	Gly	Gly	Thr	Phe	Ser	Tyr	Tyr
			20					25					30		
Trp	Ile	Glu	Trp	Val	Arg	Gln	Ala	Pro	Gly	Gln	Gly	Leu	Glu	Trp	Met
		35					40					45			
Gly	Glu	Ile	Leu	Pro	Gly	Ser	Gly	Thr	Thr	Asn	Pro	Asn	Glu	Lys	Phe
	50					55				60					
Lys	Gly	Arg	Val	Thr	Ile	Thr	Ala	Asp	Glu	Ser	Thr	Ser	Thr	Ala	Tyr
65					70				75					80	
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
				85				90					95		
Ala	Arg	Ala	Asp	Tyr	Tyr	Gly	Ser	Asp	Tyr	Val	Lys	Phe	Asp	Tyr	Trp
			100					105					110		
Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser						
		115					120								

<210> 32
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL domain of antibody 7F3com-3D4

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	Ala	Ser	Val	Gly
1				5					10					15	
Asp	Arg	Val	Thr	Ile	Thr	Cys	Lys	Ala	Ser	Gln	His	Val	Ile	Thr	His
		20						25				30			
Val	Thr	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile
		35					40				45				
Tyr	Gly	Thr	Ser	Tyr	Arg	Tyr	Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly
	50					55				60					
Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro
65					70					75				80	
Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Phe	Tyr	Glu	Tyr	Pro	Leu
				85				90					95		
Thr	Phe	Gly	Gly	Gly	Thr	Lys	Val	Glu	Ile	Lys					
			100					105							

<210> 33
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH framework region 1

 <400> 33
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser
 20 25

 <210> 34
 <211> 14
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> VH framework region 2

 <400> 34
 Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met Gly
 1 5 10

 <210> 35
 <211> 32
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> VH framework region 3

 <400> 35
 Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr Met Glu
 1 5 10 15
 Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg
 20 25 30

 <210> 36
 <211> 11
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> VH framework region 4

 <400> 36
 Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 1 5 10

 <210> 37
 <211> 25
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> VH framework region 1

 <400> 37
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser

1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser
 20 25

<210> 38
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH framework region 3

<400> 38
 Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Ser Thr Ala Tyr Met Glu
 1 5 10 15
 Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg
 20 25 30

<210> 39
 <211> 23
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL framework region 1

<400> 39
 Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15
 Asp Arg Val Thr Ile Thr Cys
 20

<210> 40
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH framework region 2

<400> 40
 Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr
 1 5 10 15

<210> 41
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH framework region 3

<400> 41
 Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
 1 5 10 15
 Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys
 20 25 30

<210> 42
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH framework region 4

<400> 42
 Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
 1 5 10

<210> 43
 <211> 591
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> VH domain of 7F3com-2H2

<400> 43
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 caggccaggg gtgtccaacc ttggcgggga tcctggacat caacttcctc atcaacaaga 120
 tgcaggaaga tccagcttcc aagtgccact gcagtgctaa tgtgaccagt tgtctctgtt 180
 tgggcattcc ctctgacaac tgcaccagac catgcttcag tgagagactg tctcagatga 240
 ccaataccac catgcaaaca agataccac tgattttcag tcgggtgaaa aaatcagttg 300
 aagtactaaa gaacaacaag tgtccatatt tttcctgtga acagccatgc aaccaaacca 360
 cggcaggcaa cgcgctgaca tttctgaaga gtcttctgga aattttccag aaagaaaaga 420
 tgagagggat gagaggcaag atatgaagat gaaatattat ttatcctatt tattaaattt 480
 aaaaagcttt ctctttaagt tgctacaatt taaaaatcaa gtaagctact ctaaatacgt 540
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<210> 44
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> VH CDR1

<400> 44
 ggaggcacct tcagctatta ctggatagag 30

<210> 45
 <211> 51
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> VH CDR2

<400> 45
 gagattttac ctggaagtgg tactactaac ccgaatgaga agttcaaggg c 51

<210> 46
 <211> 39
 <212> DNA
 <213> Artificial Sequence

<220>

<223> VH CDR3

<400> 46

gcggattact acggtagtga ttacgtcaag tttgactac

39

<210> 47

<211> 321

<212> DNA

<213> Artificial Sequence

<220>

<223> VL domain of 7F3com-2H2

<400> 47

gacatccaga tgacccagtc tccatcctcc ctgtctgcat ctgtaggaga cagagtcacc 60
atcacttgca aggcaagtca gcatgtgatt actcatgtaa cctgggtatca gcagaaacca 120
gggaaagccc ctaagctcct gatctatggg acatcctaca gctacagtgg ggtcccatca 180
aggttcagtg gcagtggatc tgggacagat ttcactctca ccatcagcag tctgcaacct 240
gaagattttg caacttatta ctgtcagcaa ttttacgagt atcctctcac gttcggcgga 300
gggaccaagg tggagatcaa a 321

<210> 48

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> VL CDR1

<400> 48

aaggcaagtc agcatgtgat tactcatgta acc

33

<210> 49

<211> 15

<212> DNA

<213> Artificial Sequence

<220>

<223> VL CDR2

<400> 49

gggacatcct acagc

15

<210> 50

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> VL CDR3

<400> 50

cagcaatttt acgagtatcc tctcacg

27

<210> 51

<211> 591

<212> DNA

<213> Homo sapiens

<400> 51

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tgcaggaaga tccagcttcc aagtgccact gcagtgctaa tgtgaccagt tgtctctgtt 180
tgggcattcc ctctgacaac tgcaccagac catgcttcag tgagagactg tctcagatga 240
ccaataccac catgcaaaca agatacccac tgattttcag tggggtgaaa aaatcagttg 300
aagtactaaa gaacaacaag tgtccatatt tttcctgtga acagccatgc aaccaaacca 360
cggcaggcaa cgcgctgaca tttctgaaga gtcttctgga aattttccag aaagaaaaga 420
tgagagggat gagaggcaag atatgaagat gaaatattat ttatcctatt tattaaattt 480
aaaaagcttt ctctttaagt tgctacaatt taaaaatcaa gtaagctact ctaaatacagt 540
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<210> 52
 <211> 144
 <212> PRT
 <213> Homo sapiens

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<400> 52
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Ala Gly Gln Gly Cys Pro Thr Leu Ala Gly Ile Leu Asp Ile Asn Phe
          20          25          30
Leu Ile Asn Lys Met Gln Glu Asp Pro Ala Ser Lys Cys His Cys Ser
          35          40          45
Ala Asn Val Thr Ser Cys Leu Cys Leu Gly Ile Pro Ser Asp Asn Cys
          50          55          60
Thr Arg Pro Cys Phe Ser Glu Arg Leu Ser Gln Met Thr Asn Thr Thr
          65          70          75          80
Met Gln Thr Arg Tyr Pro Leu Ile Phe Ser Arg Val Lys Lys Ser Val
          85          90          95
Glu Val Leu Lys Asn Asn Lys Cys Pro Tyr Phe Ser Cys Glu Gln Pro
          100          105          110
Cys Asn Gln Thr Thr Ala Gly Asn Ala Leu Thr Phe Leu Lys Ser Leu
          115          120          125
Leu Glu Ile Phe Gln Lys Glu Lys Met Arg Gly Met Arg Gly Lys Ile
          130          135          140

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<210> 53
 <211> 808
 <212> PRT
 <213> Homo sapiens

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<400> 53
Met Ala Glu Leu Leu Ala Ser Ala Gly Ser Ala Cys Ser Trp Asp Phe
 1          5          10          15
Pro Arg Ala Pro Pro Ser Phe Pro Pro Ala Ala Ser Arg Gly Gly
          20          25          30
Leu Gly Gly Thr Arg Ser Phe Arg Pro His Arg Gly Ala Glu Ser Pro
          35          40          45
Arg Pro Gly Arg Asp Arg Asp Gly Val Arg Val Pro Met Ala Ser Ser
          50          55          60
Arg Cys Pro Ala Pro Arg Gly Cys Arg Cys Leu Pro Gly Ala Ser Leu
          65          70          75          80
Ala Trp Leu Gly Thr Val Leu Leu Leu Leu Ala Asp Trp Val Leu Leu
          85          90          95
Arg Thr Ala Leu Pro Arg Ile Phe Ser Leu Leu Val Pro Thr Ala Leu
          100          105          110
Pro Leu Leu Arg Val Trp Ala Val Gly Leu Ser Arg Trp Ala Val Leu
          115          120          125
Trp Leu Gly Ala Cys Gly Val Leu Arg Ala Thr Val Gly Ser Lys Ser
          130          135          140
Glu Asn Ala Gly Ala Gln Gly Trp Leu Ala Ala Leu Lys Pro Leu Ala
          145          150          155          160

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Ala	Ala	Leu	Gly	Leu	Ala	Leu	Pro	Gly	Leu	Ala	Leu	Phe	Arg	Glu	Leu	
				165					170					175		
Ile	Ser	Trp	Gly	Ala	Pro	Gly	Ser	Ala	Asp	Ser	Thr	Arg	Leu	Leu	His	
			180					185					190			
Trp	Gly	Ser	His	Pro	Thr	Ala	Phe	Val	Val	Ser	Tyr	Ala	Ala	Ala	Leu	
		195					200					205				
Pro	Ala	Ala	Ala	Leu	Trp	His	Lys	Leu	Gly	Ser	Leu	Trp	Val	Pro	Gly	
	210					215					220					
Gly	Gln	Gly	Gly	Ser	Gly	Asn	Pro	Val	Arg	Arg	Leu	Leu	Gly	Cys	Leu	
225					230					235					240	
Gly	Ser	Glu	Thr	Arg	Arg	Leu	Ser	Leu	Phe	Leu	Val	Leu	Val	Val	Leu	
				245					250					255		
Ser	Ser	Leu	Gly	Glu	Met	Ala	Ile	Pro	Phe	Phe	Thr	Gly	Arg	Leu	Thr	
			260					265					270			
Asp	Trp	Ile	Leu	Gln	Asp	Gly	Ser	Ala	Asp	Thr	Phe	Thr	Arg	Asn	Leu	
	275						280					285				
Thr	Leu	Met	Ser	Ile	Leu	Thr	Ile	Ala	Ser	Ala	Val	Leu	Glu	Phe	Val	
	290					295					300					
Gly	Asp	Gly	Ile	Tyr	Asn	Asn	Thr	Met	Gly	His	Val	His	Ser	His	Leu	
305					310					315					320	
Gln	Gly	Glu	Val	Phe	Gly	Ala	Val	Leu	Arg	Gln	Glu	Thr	Glu	Phe	Phe	
				325					330					335		
Gln	Gln	Asn	Gln	Thr	Gly	Asn	Ile	Met	Ser	Arg	Val	Thr	Glu	Asp	Thr	
			340					345					350			
Ser	Thr	Leu	Ser	Asp	Ser	Leu	Ser	Glu	Asn	Leu	Ser	Leu	Phe	Leu	Trp	
	355						360					365				
Tyr	Leu	Val	Arg	Gly	Leu	Cys	Leu	Leu	Gly	Ile	Met	Leu	Trp	Gly	Ser	
	370					375					380					
Val	Ser	Leu	Thr	Met	Val	Thr	Leu	Ile	Thr	Leu	Pro	Leu	Leu	Phe	Leu	
385					390					395					400	
Leu	Pro	Lys	Lys	Val	Gly	Lys	Trp	Tyr	Gln	Leu	Leu	Glu	Val	Gln	Val	
				405					410					415		
Arg	Glu	Ser	Leu	Ala	Lys	Ser	Ser	Gln	Val	Ala	Ile	Glu	Ala	Leu	Ser	
			420					425					430			
Ala	Met	Pro	Thr	Val	Arg	Ser	Phe	Ala	Asn	Glu	Glu	Gly	Glu	Ala	Gln	
	435						440					445				
Lys	Phe	Arg	Glu	Lys	Leu	Gln	Glu	Ile	Lys	Thr	Leu	Asn	Gln	Lys	Glu	
	450					455					460					
Ala	Val	Ala	Tyr	Ala	Val	Asn	Ser	Trp	Thr	Thr	Ser	Ile	Ser	Gly	Met	
465					470					475					480	
Leu	Leu	Lys	Val	Gly	Ile	Leu	Tyr	Ile	Gly	Gly	Gln	Leu	Val	Thr	Ser	
				485					490					495		
Gly	Ala	Val	Ser	Ser	Gly	Asn	Leu	Val	Thr	Phe	Val	Leu	Tyr	Gln	Met	
			500					505					510			
Gln	Phe	Thr	Gln	Ala	Val	Glu	Val	Leu	Leu	Ser	Ile	Tyr	Pro	Arg	Val	
	515						520					525				
Gln	Lys	Ala	Val	Gly	Ser	Ser	Glu	Lys	Ile	Phe	Glu	Tyr	Leu	Asp	Arg	
	530					535					540					
Thr	Pro	Arg	Cys	Pro	Pro	Ser	Gly	Leu	Leu	Thr	Pro	Leu	His	Leu	Glu	
545					550					555					560	
Gly	Leu	Val	Gln	Phe	Gln	Asp	Val	Ser	Phe	Ala	Tyr	Pro	Asn	Arg	Pro	
				565					570					575		
Asp	Val	Leu	Val	Leu	Gln	Gly	Leu	Thr	Phe	Thr	Leu	Arg	Pro	Gly	Glu	
				580				585					590			
Val	Thr	Ala	Leu	Val	Gly	Pro	Asn	Gly	Ser	Gly	Lys	Ser	Thr	Val	Ala	
	595					600						605				
Ala	Leu	Leu	Gln	Asn	Leu	Tyr	Gln	Pro	Thr	Gly	Gly	Gln	Leu	Leu	Leu	
	610					615					620					
Asp	Gly	Lys	Pro	Leu	Pro	Gln	Tyr	Glu	His	Arg	Tyr	Leu	His	Arg	Gln	
625					630					635					640	
Val	Ala	Ala	Val	Gly	Gln	Glu	Pro	Gln	Val	Phe	Gly	Arg	Ser	Leu	Gln	
				645					650					655		

Glu Asn Ile Ala Tyr Gly Leu Thr Gln Lys Pro Thr Met Glu Glu Ile
 660 665 670
 Thr Ala Ala Ala Val Lys Ser Gly Ala His Ser Phe Ile Ser Gly Leu
 675 680 685
 Pro Gln Gly Tyr Asp Thr Glu Val Asp Glu Ala Gly Ser Gln Leu Ser
 690 695 700
 Gly Gly Gln Arg Gln Ala Val Ala Leu Ala Arg Ala Leu Ile Arg Lys
 705 710 715 720
 Pro Cys Val Leu Ile Leu Asp Asp Ala Thr Ser Ala Leu Asp Ala Asn
 725 730 735
 Ser Gln Leu Gln Val Glu Gln Leu Leu Tyr Glu Ser Pro Glu Arg Tyr
 740 745 750
 Ser Arg Ser Val Leu Leu Ile Thr Gln His Leu Ser Leu Val Glu Gln
 755 760 765
 Ala Asp His Ile Leu Phe Leu Glu Gly Gly Ala Ile Arg Glu Gly Gly
 770 775 780
 Thr His Gln Gln Leu Met Glu Lys Lys Gly Cys Tyr Trp Ala Met Val
 785 790 795 800
 Gln Ala Pro Ala Asp Ala Pro Glu
 805

<210> 54
 <211> 140
 <212> PRT
 <213> Homo sapiens

<400> 54
 Met Val Leu Thr Ser Ala Leu Leu Leu Cys Ser Val Ala Gly Gln Gly
 1 5 10 15
 Cys Pro Thr Leu Ala Gly Ile Leu Asp Ile Asn Phe Leu Ile Asn Lys
 20 25 30
 Met Gln Glu Asp Pro Ala Ser Lys Cys His Cys Ser Ala Asn Val Thr
 35 40 45
 Ser Cys Leu Cys Leu Gly Ile Pro Ser Asp Asn Cys Thr Arg Pro Cys
 50 55 60
 Phe Ser Glu Arg Leu Ser Gln Met Thr Asn Thr Thr Met Gln Thr Arg
 65 70 75 80
 Tyr Pro Leu Ile Phe Ser Arg Val Lys Lys Ser Val Glu Val Leu Lys
 85 90 95
 Asn Asn Lys Cys Pro Tyr Phe Ser Cys Glu Gln Pro Cys Asn Gln Thr
 100 105 110
 Thr Ala Gly Asn Ala Leu Thr Phe Leu Lys Ser Leu Leu Glu Ile Phe
 115 120 125
 Gln Lys Glu Lys Met Arg Gly Met Arg Gly Lys Ile
 130 135 140

<210> 55
 <211> 2171
 <212> DNA
 <213> Homo sapiens

<400> 55
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 aaagctcacg tcaccaactg ctgcagttat ctccctgaatc aggctgaggg tctttgtgtg 120
 gcacccagag atagttgggt gacaaatcac ctccaggttg gggatgcctc agacttgtga 180
 tgggactggg cagatgcac tgggaaggct ggaccttgga gagtgaggcc ctgaggcgag 240
 acatgggcac ctggctcctg gcctgcacat gcacatctgcac ctgtgtctgc ttgggagtct 300
 ctgtcacagg ggaaggacaa gggccaaggc ctagaacctt cacctgcctc accaacaaca 360
 ttctcaggat cgattgccac tgggtctgcc cagagctggg acagggctcc agccctggc 420
 tcctcttcac cagcaaccag gctcctggcg gcacacataa gtgcacattg cggggcagtg 480

agtgcaccgt	cgtgctgcc	cctgaggcag	tgctcgtgcc	atctgacaat	ttcaccatca	540
ctttccacca	ctgcatgtct	gggagggagc	aggtcagcct	ggtggaccg	gagtacctgc	600
cccggagaca	cgttaagctg	gacccgccct	ctgacttgca	gagcaacatc	agttctggcc	660
actgcatact	gacctggagc	atcagtcctg	ccttggagcc	aatgaccaca	cttctcagct	720
atgagctggc	cttcaagaag	caggaagagg	cctgggagca	ggcccagcac	agggatcaca	780
ttgtcggggt	gacctggctt	atacttgaag	cctttgagct	ggaccctggc	tttatccatg	840
aggccaggct	gcgtgtccag	atggccacac	tggaggatga	tgtggtagag	gaggagcgtt	900
atacaggcca	gtggagttag	tggagccagc	ctgtgtgctt	ccaggctccc	cagagacaag	960
gccctctgat	cccaccctgg	gggtggccag	gcaacaccct	tgttgctgtg	tccatctttc	1020
tcttgctgac	tggcccgacc	tacctcctgt	tcaagctgtc	gcccagggtg	aagagaatct	1080
tctaccagaa	cgtgccctct	ccagcgatgt	tcttccagcc	cctctacagt	gtacacaatg	1140
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gtggcccagc	gcgtccttgg	aaatctgtgg	ccctggagga	ggaacaggag	ggccctggga	1320
ccaggctccc	ggggaacctg	agctcagagg	atgtgctgcc	agcagggtgt	acggagtgga	1380
gggtacagac	gcttgccctat	ctgccacagg	aggactgggc	ccccacgtcc	ctgactaggc	1440
cggctccccc	agactcagag	ggcagcagga	gcagcagcag	cagcagcagc	agcaacaaca	1500
acaactactg	tgccttgggc	tgctatgggg	gatggcacct	ctcagccctc	ccaggaaaca	1560
cacagagctc	tgggcccac	ccagccctgg	cctgtggcct	ttcttgtgac	catcagggcc	1620
tggagagcca	gcaaggagtt	gcctgggtgc	tggctggtea	ctgccagagg	cctgggctgc	1680
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tggagccctt	gtctgagact	gaacctcctg	agaagggggc	cctagcagcg	gtcagaggtc	1860
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cagcctctac	cctcagcatc	ctggccacaa	gttcttccct	ccattgtccc	ttttctttat	1980
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agggccagcc	tgggcccagt	ggacacaggt	aaggcaccat	gaccacctgg	tgtgacctct	2100
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aaaaaaaaaa	a					2171

<210> 56
 <211> 2175
 <212> DNA
 <213> Homo sapiens

<400> 56						
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gcacccagag	atagttgggt	gacaaatcac	ctccaggttg	gggatgcctc	agacttgtga	180
tgggactggg	cagatgcata	tgggaagtaa	ctgctgcaag	aacggacaga	caactgtgca	240
gagaacttgc	cacggtgttt	catgctgtgg	ctggtgggtc	caggctgcac	gctccattct	300
aggaaaaggg	ccctcagccc	agtcccttgc	aggctggacc	ttggagagtg	aggccctgag	360
gcgagacatg	ggcacctggc	tcttggcctg	catctgcata	tgcacctgtg	tctgcttggg	420
agtctctgtc	acaggggaag	gacaaggggc	aaggtctaga	accttcacct	gcctcaccaa	480
caacattctc	aggatcgatt	gccactggtc	tgccccagag	ctgggacagg	gctccagccc	540
ctggctcctc	ttcaccaggc	tcttggcggc	acacataagt	gcatacttgcg	gggcagttag	600
tgcaccgtcg	tgctgccacc	tgaggcagtg	ctcgtgccat	ctgacaattt	caccatcact	660
ttccaccact	gcatgtctgg	gagggagcag	gtcagcctgg	tggaccgga	gtacctgccc	720
cggagacacg	agcaacatca	gttctggcca	ctgcatacctg	acctggagca	tcagtcctgc	780
cttggagcca	atgaccacac	ttctcagcta	tgagctggcc	ttcaagaagc	aggaagaggc	840
ctgggagcag	gcccagcaca	gggatcacat	tgtcgggggtg	acctggctta	tacttgaagc	900
cttttgagctg	gacctggctt	ttatccatga	ggccaggctg	cgtgtccaga	tggccacact	960
ggaggatgat	gtggtagagg	aggagcgtaa	tacagggcag	tggagttagt	ggagccagcc	1020
tgtgtgcttc	caggctcccc	agagacaagg	ccctctgata	ccaccctggg	ggtggccagg	1080
caacaccctt	gttgctgtgt	ccatctttct	cctgctgact	ggcccagacct	acctcctggt	1140
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tgtgctggca	ccccacaggg	agccttggag	ccctgcgtcc	aggaggccac	tgcactgctc	1260
acttgtggcc	cagcgcgtcc	ttggaaatct	gtggccctgg	aggaggaaca	ggagggccct	1320
gggaccaggc	tcccggggaa	cctgagctca	gaggatgtgc	tgccagcagg	gtgtacggag	1380
tggagggtac	agacgcttgc	ctatctgcca	caggaggact	gggcccccac	gtccctgact	1440
agggcggctc	ccccagactc	agagggcagc	aggagcagca	gcagcagcag	cagcagcaac	1500

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aacaacaact actgtgcctt gggctgctat gggggatggc acctctcagc cctcccagga 1560
aacacacaga gctctgggcc catcccagcc ctggcctgtg gcctttcttg tgaccatcag 1620
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ttatccctga cctctctgag aagtgggggtg tggctctctca gctgttctgc cctcataccc 2040
ttaaagggcc agcctgggcc cagtggacac aggtaaggca ccatgaccac ctggtgtgac 2100
ctctctgtgc cttactgagg cacctttcta gagattaaaa ggggcttgat ggctgttaaa 2160
aaaaaaaaaa aaaaaa
2175

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<210> 57
<211> 1451
<212> DNA
<213> Homo sapiens

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<400> 57
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tgcccctgct gggagtgggg ctgaacacga caattctgac gcccaatggg aatgaagaca 120
ccacagctga tttcttcttg accactatgc ccactgactc cctcagtgtt tccactctgc 180
ccctcccaga ggttcagtggt tttgtgttca atgtcgagta catgaattgc acttgggaaca 240
gcagctctga gccccagcct accaacctca ctctgcatta ttggtacaag aactcggata 300
atgataaagt ccagaagtgc agccactatc tattctctga agaaatcact tctggctgtc 360
agttgcaaaa aaaggagatc cacctctacc aaacatttgt tgttcagctc caggaccac 420
gggaacccag gagacaggcc acacagatgc taaaactgca gaatctgggt atcccctggg 480
ctccagagaa cctaacactt cacaaactga gtgaatocca gctagaactg aactggaaca 540
acagattctt gaaccactgt ttggagcact tgggtgcagta ccggactgac tgggaccaca 600
gctggactga acaatcagtg gattatagac ataagttctc cttgcctagt gtggatgggc 660
agaaacgcta cacgtttcgt gttcggagcc gctttaacct actctgtgga agtgctcagc 720
attggagtga atggagccac ccaatccact gggggagcaa tacttcaaaa gagaatcctt 780
tcctgtttgc attggaagcc gtggttatct ctggttggtc catgggattg attatcagcc 840
ttctctgtgt gtatttcttg ctggaacgga cgatgccccg aattcccacc ctgaagaacc 900
tagaggatct tgttactgaa taccacggga acttttcggc ctggagtggg gtgtctaagg 960
gactggctga gactctgcag ccagactaca gtgaacgact ctgcctcgtc agtgagattc 1020
ccccaaaagg agggggccctt ggggaggggc ctggggcctc cccatgcaac cagcatagcc 1080
cctactgggc ccccccatgt tacaccctaa agcctgaaac ctgaacccca atcctctgac 1140
agaagaaccc cagggtcctg tagccctaag tggtaactaac tttccttcat tcaaccacc 1200
tgcgctcat actcacctca cccactgtg gctgatttgg aattttgtgc ccccatgtaa 1260
gcaccccttc atttggcatt cccacttga gaattacct tttgccccga acatgttttt 1320
cttctccctc agtctggccc ttctttttcg caggattctt cctccctccc tctttccctc 1380
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tgataatcat c
1451

```

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<210> 58
<211> 521
<212> PRT
<213> Homo sapiens

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<400> 58
Met Gly Leu Gly Arg Cys Ile Trp Glu Gly Trp Thr Leu Glu Ser Glu
1           5           10           15
Ala Leu Arg Arg Asp Met Gly Thr Trp Leu Leu Ala Cys Ile Cys Ile
20          25          30
Cys Thr Cys Val Cys Leu Gly Val Ser Val Thr Gly Glu Gly Gln Gly
35          40          45
Pro Arg Ser Arg Thr Phe Thr Cys Leu Thr Asn Asn Ile Leu Arg Ile
50          55          60
Asp Cys His Trp Ser Ala Pro Glu Leu Gly Gln Gly Ser Ser Pro Trp

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65					70					75					80
Leu	Leu	Phe	Thr	Ser	Asn	Gln	Ala	Pro	Gly	Gly	Thr	His	Lys	Cys	Ile
				85					90					95	
Leu	Arg	Gly	Ser	Glu	Cys	Thr	Val	Val	Leu	Pro	Pro	Glu	Ala	Val	Leu
			100					105					110		
Val	Pro	Ser	Asp	Asn	Phe	Thr	Ile	Thr	Phe	His	His	Cys	Met	Ser	Gly
		115					120					125			
Arg	Glu	Gln	Val	Ser	Leu	Val	Asp	Pro	Glu	Tyr	Leu	Pro	Arg	Arg	His
	130					135					140				
Val	Lys	Leu	Asp	Pro	Pro	Ser	Asp	Leu	Gln	Ser	Asn	Ile	Ser	Ser	Gly
145					150					155					160
His	Cys	Ile	Leu	Thr	Trp	Ser	Ile	Ser	Pro	Ala	Leu	Glu	Pro	Met	Thr
			165						170					175	
Thr	Leu	Leu	Ser	Tyr	Glu	Leu	Ala	Phe	Lys	Lys	Gln	Glu	Glu	Ala	Trp
			180					185						190	
Glu	Gln	Ala	Gln	His	Arg	Asp	His	Ile	Val	Gly	Val	Thr	Trp	Leu	Ile
		195					200					205			
Leu	Glu	Ala	Phe	Glu	Leu	Asp	Pro	Gly	Phe	Ile	His	Glu	Ala	Arg	Leu
	210					215					220				
Arg	Val	Gln	Met	Ala	Thr	Leu	Glu	Asp	Asp	Val	Val	Glu	Glu	Glu	Arg
225					230					235					240
Tyr	Thr	Gly	Gln	Trp	Ser	Glu	Trp	Ser	Gln	Pro	Val	Cys	Phe	Gln	Ala
			245						250					255	
Pro	Gln	Arg	Gln	Gly	Pro	Leu	Ile	Pro	Pro	Trp	Gly	Trp	Pro	Gly	Asn
			260					265					270		
Thr	Leu	Val	Ala	Val	Ser	Ile	Phe	Leu	Leu	Leu	Thr	Gly	Pro	Thr	Tyr
		275					280					285			
Leu	Leu	Phe	Lys	Leu	Ser	Pro	Arg	Val	Lys	Arg	Ile	Phe	Tyr	Gln	Asn
	290					295					300				
Val	Pro	Ser	Pro	Ala	Met	Phe	Phe	Gln	Pro	Leu	Tyr	Ser	Val	His	Asn
305					310					315					320
Gly	Asn	Phe	Gln	Thr	Trp	Met	Gly	Ala	His	Gly	Ala	Gly	Val	Leu	Leu
			325						330					335	
Ser	Gln	Asp	Cys	Ala	Gly	Thr	Pro	Gln	Gly	Ala	Leu	Glu	Pro	Cys	Val
			340					345					350		
Gln	Glu	Ala	Thr	Ala	Leu	Leu	Thr	Cys	Gly	Pro	Ala	Arg	Pro	Trp	Lys
		355					360					365			
Ser	Val	Ala	Leu	Glu	Glu	Glu	Gln	Glu	Gly	Pro	Gly	Thr	Arg	Leu	Pro
	370					375					380				
Gly	Asn	Leu	Ser	Ser	Glu	Asp	Val	Leu	Pro	Ala	Gly	Cys	Thr	Glu	Trp
385					390					395					400
Arg	Val	Gln	Thr	Leu	Ala	Tyr	Leu	Pro	Gln	Glu	Asp	Trp	Ala	Pro	Thr
			405						410					415	
Ser	Leu	Thr	Arg	Pro	Ala	Pro	Pro	Asp	Ser	Glu	Gly	Ser	Arg	Ser	Ser
			420					425					430		
Ser	Ser	Ser	Ser	Ser	Ser	Asn	Asn	Asn	Asn	Tyr	Cys	Ala	Leu	Gly	Cys
		435				440						445			
Tyr	Gly	Gly	Trp	His	Leu	Ser	Ala	Leu	Pro	Gly	Asn	Thr	Gln	Ser	Ser
	450					455					460				
Gly	Pro	Ile	Pro	Ala	Leu	Ala	Cys	Gly	Leu	Ser	Cys	Asp	His	Gln	Gly
465					470					475					480
Leu	Glu	Thr	Gln	Gln	Gly	Val	Ala	Trp	Val	Leu	Ala	Gly	His	Cys	Gln
			485						490					495	
Arg	Pro	Gly	Leu	His	Glu	Asp	Leu	Gln	Gly	Met	Leu	Leu	Pro	Ser	Val
			500					505					510		
Leu	Ser	Lys	Ala	Arg	Ser	Trp	Thr	Phe							
		515					520								

<210> 59
 <211> 332
 <212> PRT

<213> Homo sapiens

<400> 59

Met	His	Leu	Gly	Ser	Asn	Cys	Cys	Lys	Asn	Gly	Gln	Thr	Leu	Leu	Gln	
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Arg	Thr	Cys	His	Gly	Val	Ser	Cys	Cys	Gly	Trp	Trp	Phe	Gln	Ala	Ala	
			20					25					30			
Arg	Ser	Ile	Leu	Gly	Lys	Gly	Pro	Ser	Ala	Gln	Ser	Leu	Ala	Gly	Trp	
		35					40					45				
Thr	Leu	Glu	Ser	Glu	Ala	Leu	Arg	Arg	Asp	Met	Gly	Thr	Trp	Leu	Leu	
	50					55					60					
Ala	Cys	Ile	Cys	Ile	Cys	Thr	Cys	Val	Cys	Leu	Gly	Val	Ser	Val	Thr	
65					70				75						80	
Gly	Glu	Gly	Gln	Gly	Pro	Arg	Ser	Arg	Thr	Phe	Thr	Cys	Leu	Thr	Asn	
			85					90						95		
Asn	Ile	Leu	Arg	Ile	Asp	Cys	His	Trp	Ser	Ala	Pro	Glu	Leu	Gly	Gln	
		100						105					110			
Gly	Ser	Ser	Pro	Trp	Leu	Leu	Phe	Thr	Arg	Leu	Leu	Ala	Ala	His	Ile	
		115					120					125				
Ser	Ala	Ser	Cys	Gly	Ala	Val	Ser	Ala	Pro	Ser	Cys	Cys	His	Leu	Arg	
	130					135					140					
Gln	Cys	Ser	Cys	His	Leu	Thr	Ile	Ser	Pro	Ser	Leu	Ser	Thr	Thr	Ala	
145					150					155					160	
Cys	Leu	Gly	Gly	Ser	Arg	Ser	Ala	Trp	Trp	Thr	Arg	Ser	Thr	Cys	Pro	
			165					170						175		
Gly	Asp	Thr	Ser	Asn	Ile	Ser	Ser	Gly	His	Cys	Ile	Leu	Thr	Trp	Ser	
		180						185					190			
Ile	Ser	Pro	Ala	Leu	Glu	Pro	Met	Thr	Thr	Leu	Leu	Ser	Tyr	Glu	Leu	
		195					200					205				
Ala	Phe	Lys	Lys	Gln	Glu	Glu	Ala	Trp	Glu	Gln	Ala	Gln	His	Arg	Asp	
	210					215					220					
His	Ile	Val	Gly	Val	Thr	Trp	Leu	Ile	Leu	Glu	Ala	Phe	Glu	Leu	Asp	
225					230					235					240	
Pro	Gly	Phe	Ile	His	Glu	Ala	Arg	Leu	Arg	Val	Gln	Met	Ala	Thr	Leu	
			245					250						255		
Glu	Asp	Asp	Val	Val	Glu	Glu	Glu	Arg	Tyr	Thr	Gly	Gln	Trp	Ser	Glu	
		260						265					270			
Trp	Ser	Gln	Pro	Val	Cys	Phe	Gln	Ala	Pro	Gln	Arg	Gln	Gly	Pro	Leu	
		275					280					285				
Ile	Pro	Pro	Trp	Gly	Trp	Pro	Gly	Asn	Thr	Leu	Val	Ala	Val	Ser	Ile	
	290					295					300					
Phe	Leu	Leu	Leu	Thr	Gly	Pro	Thr	Tyr	Leu	Leu	Phe	Lys	Leu	Ser	Pro	
305					310					315					320	
Arg	Leu	Gly	Trp	Gly	Pro	Thr	Gly	Pro	Val	Cys	Cys					
			325						330							

<210> 60

<211> 369

<212> PRT

<213> Homo sapiens

<400> 60

Met	Leu	Lys	Pro	Ser	Leu	Pro	Phe	Thr	Ser	Leu	Leu	Phe	Leu	Gln	Leu	
1				5					10					15		
Pro	Leu	Leu	Gly	Val	Gly	Leu	Asn	Thr	Thr	Ile	Leu	Thr	Pro	Asn	Gly	
			20					25					30			
Asn	Glu	Asp	Thr	Thr	Ala	Asp	Phe	Phe	Leu	Thr	Thr	Met	Pro	Thr	Asp	
		35					40					45				
Ser	Leu	Ser	Val	Ser	Thr	Leu	Pro	Leu	Pro	Glu	Val	Gln	Cys	Phe	Val	
	50					55					60					
Phe	Asn	Val	Glu	Tyr	Met	Asn	Cys	Thr	Trp	Asn	Ser	Ser	Ser	Glu	Pro	

65					70					75					80
Gln	Pro	Thr	Asn	Leu	Thr	Leu	His	Tyr	Trp	Tyr	Lys	Asn	Ser	Asp	Asn
				85					90					95	
Asp	Lys	Val	Gln	Lys	Cys	Ser	His	Tyr	Leu	Phe	Ser	Glu	Glu	Ile	Thr
			100					105					110		
Ser	Gly	Cys	Gln	Leu	Gln	Lys	Lys	Glu	Ile	His	Leu	Tyr	Gln	Thr	Phe
		115					120					125			
Val	Val	Gln	Leu	Gln	Asp	Pro	Arg	Glu	Pro	Arg	Arg	Gln	Ala	Thr	Gln
	130					135					140				
Met	Leu	Lys	Leu	Gln	Asn	Leu	Val	Ile	Pro	Trp	Ala	Pro	Glu	Asn	Leu
145					150					155					160
Thr	Leu	His	Lys	Leu	Ser	Glu	Ser	Gln	Leu	Glu	Leu	Asn	Trp	Asn	Asn
				165				170						175	
Arg	Phe	Leu	Asn	His	Cys	Leu	Glu	His	Leu	Val	Gln	Tyr	Arg	Thr	Asp
			180					185					190		
Trp	Asp	His	Ser	Trp	Thr	Glu	Gln	Ser	Val	Asp	Tyr	Arg	His	Lys	Phe
		195					200					205			
Ser	Leu	Pro	Ser	Val	Asp	Gly	Gln	Lys	Arg	Tyr	Thr	Phe	Arg	Val	Arg
	210					215					220				
Ser	Arg	Phe	Asn	Pro	Leu	Cys	Gly	Ser	Ala	Gln	His	Trp	Ser	Glu	Trp
225					230				235						240
Ser	His	Pro	Ile	His	Trp	Gly	Ser	Asn	Thr	Ser	Lys	Glu	Asn	Pro	Phe
				245				250						255	
Leu	Phe	Ala	Leu	Glu	Ala	Val	Val	Ile	Ser	Val	Gly	Ser	Met	Gly	Leu
			260					265					270		
Ile	Ile	Ser	Leu	Leu	Cys	Val	Tyr	Phe	Trp	Leu	Glu	Arg	Thr	Met	Pro
		275					280					285			
Arg	Ile	Pro	Thr	Leu	Lys	Asn	Leu	Glu	Asp	Leu	Val	Thr	Glu	Tyr	His
	290					295					300				
Gly	Asn	Phe	Ser	Ala	Trp	Ser	Gly	Val	Ser	Lys	Gly	Leu	Ala	Glu	Ser
305					310					315					320
Leu	Gln	Pro	Asp	Tyr	Ser	Glu	Arg	Leu	Cys	Leu	Val	Ser	Glu	Ile	Pro
				325					330					335	
Pro	Lys	Gly	Gly	Ala	Leu	Gly	Glu	Gly	Pro	Gly	Ala	Ser	Pro	Cys	Asn
		340					345					350			
Gln	His	Ser	Pro	Tyr	Trp	Ala	Pro	Pro	Cys	Tyr	Thr	Leu	Lys	Pro	Glu
		355					360					365			

Thr

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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH CDR2

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 Glu Ile Leu Pro Gly Ser Gly Thr Thr Asn Tyr Asn Glu Lys Phe Lys
 1 5 10 15
 Gly

<210> 62
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>

<223> VL CDR1

<400> 62

Lys Ala Ser Gln His Val Ile Thr His Val Thr
1 5 10

<210> 63

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR3

<400> 63

Gln His Phe Tyr Asp Tyr Pro Leu Thr
1 5

<210> 64

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR3

<400> 64

Gln His Phe Tyr Glu Tyr Pro Leu Thr
1 5

<210> 65

<211> 7

<212> PRT

<213> Artificial Sequence

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<223> VL CDR2

<400> 65

Gly Thr Ser Tyr Ser Tyr Ser
1 5